# IONIZING RADIATION LONG-TERM IMPACT ON AQUATIC BIOTA IN WATER BODIES WITH DIFFFERENT LEVELS OF RADIOACTIVE CONTAMINATION IN BELARUSIAN SECTOR OF CHERNOBYL NUCLEAR ACCIDENT ZONE

**[1]GOLUBEV A., [2]STOLYAR O, [3]SIKORSKI V.**

[1]International Sakharov Environmental University. 22009. Minsk, Belarus. algiv@rambler.ru
[2]Ternopil V. Hnatyuk National Pedagogical University, Ternopil, Ukraine
[3]Mosyr State Pedagogical University named after I. Shamyakin. Mosyr, Belarus

The dynamics of radionuclide activity in bottom deposits, water column and biota of the Pripyat inlet and closed the Perstok Lake at the vicinity of Chernobyl Nuclear Plant has been investigating during 1986-2010. The set of biololgical test criteria reflecting impact of ionizing radiation on pulmonate mollusk *Lymnaea stagnalis* populations from these reservoirs has been also defined. There are the structure of haemolymph cell populations, the levels of cells with cytogenetic damages, the survival of embryos, the rate of growth and reproduction of individuals and their radioresistance (survival after acute irradiation of γ-rays in dose of 500 Gy). The highest values of the biota γ-activity (up to 1100 kBq $kg^{-1}$ wet mass) were noted in summer, 1987. After that the biota activity in both reservoirs was quickly decreased as the result of short-living radioisotopes decay. The activity of bottom sediments and biota in the Pripyat inlet decreased to natural level but in the Perstok Lake they remained on rather high level – up to 400 kBq $m^{-2}$ and 490 – 3800 Bq $kg^{-1}$ wet mass respectively in 2005-2008. Alongside the increase of transuranium α-isotope $^{241}$Am activity in bottom sediments of the Perstok Lake has been observed since 2006. Absorbed dose from external γ-radiation in *L.stagnalis* in the most contaminated Perstok Lake has been decreasing from 4,2 to 0,2 μGy $h^{-1}$ during 1986–2010. Nevertheless, obvious negative signs of radiation chronic impact were noted in the Perstok Lake *L.stagnalis* populations. Primarily, it is resulted the DNA structure lesions that lead to increasing of dead cells share in hemolymph cells populations. Cells share with the interphase destruction and cytogenetic aberrations (micronuclei), compared with the populations from the Pripyat inlet, have considerably grown there. Nevertheless, before-mentioned negative effects did not influence seriously on organism and populations levels viability. Considerable part of damaged cells by means of apoptosis might be caused by destruction. So, the mortality of embryos (the most vulnerable stage of lifespan) in both populations is low and they are capable to maintain sufficient level of reproduction at chronic radioactive impact conditions. Radioresistance of the Perstok Lake populations had been significantly higher than those for the Pripyat inlet populations up to 2002. Obviously, populations from the Perstok Lake have been exposed in the results of more strict natural selection of radioresistance increasing. In consequence of overall radioactive contamination decrease in two reservoirs the average radioresistance on their *L.stagnalis* populations fall to the level characterized for those in non-contaminated areas in 2002-2007.